NOTES ON THREE ANOMALOUS CASES IN ONE FAMILY.*

By Horatio C. Wood, M.D., LL.D.

Although the cases which are recorded in this brief memoir are still alive, and therefore it is not possible to demonstrate the exact nature of the lesions, the clinical picture is in many features so peculiar that the histories have seemed worthy of record. In making such record I shall first give the details of the cases and then make my remarks upon the same.

The father of the F. family was a farmer, healthy; died at 77 of apoplexy. Mother died at 67 of cancer of the pancreas, after an illness of eighteen years with obscure abdominal symptoms, various diagnoses having been made. No nervous symptoms at all. No knowledge as to grandparents. Uncles and aunts all healthy. No nervous cases among the first-cousins.

Case number 1. This case I have never seen, the man living in California, and therefore can simply give an account as received by letter from him. The "it" of which he speaks is a pain, chiefly located on the outer side of the left leg, below the knee. Mr. J. F. says: "It came on very gradually when walking, and increased to such an extent that I was not able to walk continuously for ten minutes without stopping to rest, when the pain would almost cease, but on starting to walk again the pain would increase, and I was obliged to stop again to get relief. In this way I managed to get around to attend to my work. When sitting or lying down I suffered very little, and then only after walking some distance. The pain was a dull throbbing pain, unlike the pain of neuralgia or rheumatism I sometimes feel in other parts of the body; nor did the pain extend beyond the ankle, but when severest I felt it from the knee up to the hip. There was no swelling of any kind, nor stiffness of muscles or joints. I could press hard on the spot where it commenced, or strike it with my fist without bringing it on. Nor did rubbing have any effect when the pain was greatest. When sitting with my foot propped up as high as my head the pain decreased most rapidly. Change of weather did not affect my condition to any extent except in very hot weather, when I could walk less. In appearance there was no difference between the two legs except the flesh of the leg around the affected part was softer or flabbier than the flesh around the calf of the other leg.

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"After trying numerous remedies both external and internal, together with massage and electrical appliances, without getting relief, I went East, thinking a change of climate might help me, but experienced no change. [The writer of the letter lives in San Francisco, Cala.] I returned to California after four months' visit in the East, and stopping at a place where an old California stage-driver made his home, who seeing me limp along reached down in his pocket and pulled out a small bear's bone that he carried and told me to carry it in my pocket for a few weeks; which I did without giving it any thought, and to my great surprise and delight I found myself entirely free from pain in a few weeks, and could walk for several hours without any inconvenience.

"I was entirely free from pain till some nine years later, when I had the same trouble, which lasted for a year; after trying a number of doctors who made that subject a specialty, without any relief, about four months after I stopped taking medicines, and began to improve slowly; and in a few weeks was all right again, until about two years ago, when I experienced the third attack and had a new diagnosis given me, which briefly stated is that the pain is caused by the inner enlarged or varicose vein pressing on the muscles of the sciatic nerve, and that a simple operation would remove the cause, but I did not consent to the operation, and after I stopped taking medicines altogether I gradually commenced to improve and am now all right again.

"The pains lasted about a year in each case, at intervals of some eight years. I should not forget to state that I traced up the old Californian with the bone, and he kindly expressed it to me in both the latter cases, but in neither case did the bone have the desired effect. It had lost its charm."

The second case is W. I. F., aged 46. Carpenter. Single. Enjoyed good health from childhood until 1887, when he had a severe attack of croupous pneumonia He recovered more or less imperfectly, having cough and pulmonary pain for a long time.

A few years after his attack of pneumonia a heavy wagon passed over his left leg, injuring the periosteum of the tibia, which was a long time in healing, but this injury also got well.

In September, 1895, while working in the field, he perspired freely and then sat on the ground for a short time. In the evening he returned home with a chill and fever, and symptoms supposed to be those of acute inflammatory rheumatism developed. The pain was first noticed in the left hip and leg, and was very severe; it would appear now in the hip, then in the knee, then in the ankle. This pain would only come on towards evening. The usual antirheumatic remedies were given heavily, also free blistering with no perceptible effect. When the pain was severe in one place a little rubbing would relieve it, but it would appear instantly in another joint; and often it would shoot up the spine and locate in the back of the head or over the forehead. These symptoms continued for three weeks and frequently required hypodermic injections of morphine. After the acute symptoms ceased the leg was in a helpless condition. Mr. F. could not flex the toes or leg, and there was so much weakness in the hip that he could not stand up. He managed to creep around on his hands and knees for a period of eight months. After that he could raise himself and walk by supporting himself with the back of a chair and slinging his leg forward while walking. The weakness of the back was very marked, and improved only slightly during the following year.

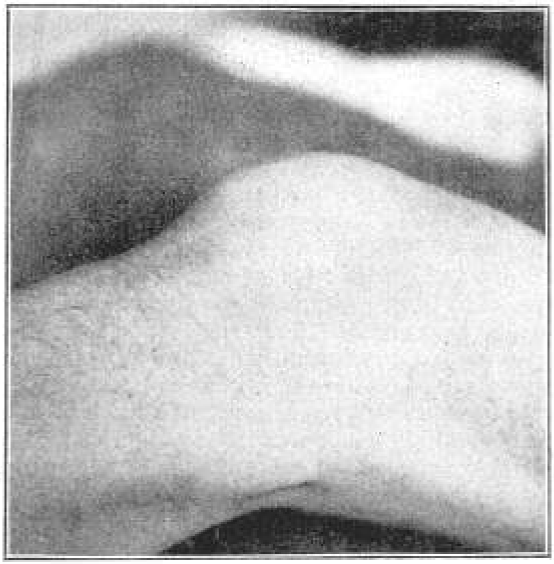

Fig. I. The left knee, one inch more in circumference than the right knee, and having the appearance of an arthropathic joint.

In November, 1896, he entered the University of Pennsylvania Hospital, and was first seen by myself. His weight on admission was 207 pounds. There was then marked atrophy of the muscles of the thigh but not of the calf of the leg; he was unable to cross the unsound leg, and the patella reflexes were lost. The thigh muscles responded to strong faradic current. The tibialis anticus and peronei did not respond to faradism but did respond to a very strong galvanic current. The posterior leg muscles responded to strong faradism.

At present the left leg is very much in the same condition as it was in November, 1896. There is no distinct loss of sensibility or of the thermic sense; the thigh muscles are very much wasted as are also the muscles below the knee, especially the anterior group. The knee-jerk is absent in the left leg even on reinforcement; in the right leg it is about normal. The left thigh muscles respond feebly to strong faradic currents but give the normal reaction to the galvanic current. The tibialis anticus does not respond to either faradism or galvanism. The gastrocnemius and the peronei muscles do not respond to the faradic current; with the galvanic they give An. Cl.C.>K. Cl.C. At no time has there been any involvement of the bladder. The left knee is swollen, with rounded outline, one inch more in circumference than the right knee, painless, not tender, and having the appearance of an Arthropathic joint.

The temperature of Mr. F. is almost always subnormal, with marked irregularity, varying in the two weeks under observation from 96.5 to 98.5. Dr. Howard Mellor reports as follows concerning Mr. F.'s eyes:

"Dec. 12, 1898, vision in each eye 6-9 (?) without a correcting lens, accommodation .50 m. p. p 15 c. m. with +4. External appearances normal. Ophthalmoscope shows in the right eye: Media clear, round disc, broadened, nerve and retina over capillary, disc dirty red in color, small central physiological excavation, in which there can be seen a marked venous pulse in upper vein. Refraction, vertical vessels, +1; horizontal vessels, emmetropic:

"In the left eye: media are clear, vertically ovoid disc, upper and lower edges of disc veiled by hazy and swollen nerve fibers, these being dirty red in color, temporal third of disc grayish, nasal third dirty red in superficial layers, and grayish in deeper layers broadened scleral ring down and out. Refraction, vertical vessels, +½; horizontal vessels, emmetropic. The fields were taken in each eye by my assistant, Dr. Charles C. Rankin, for form and color, and found much contracted, more so in left eye than right eye, as shown in accompanying diagrams."

The third case is that of a sister, Miss L. E. F. Aged 35. Single. She was in good health until the latter part of 1897, when she began to notice in the right thumb tingling and numbness, which in a short time extended to the neighboring two fingers, and some weeks later was followed by severe pain in the right shoulder, over the scapula. At first this pain came on only at night time, waking her out of sleep, and was relieved by local hot applications. After several months the pain developed during the day, but seems always to have been paroxysmal. Some months later numbness appeared in the right leg, and later she suffered from some pain in the hip and thigh, though never in the foot. Recently there has been at times sensations of numbness in the left hand. Also, apparently in the early part of the present year, she began to suffer from motor disability in the right foot.

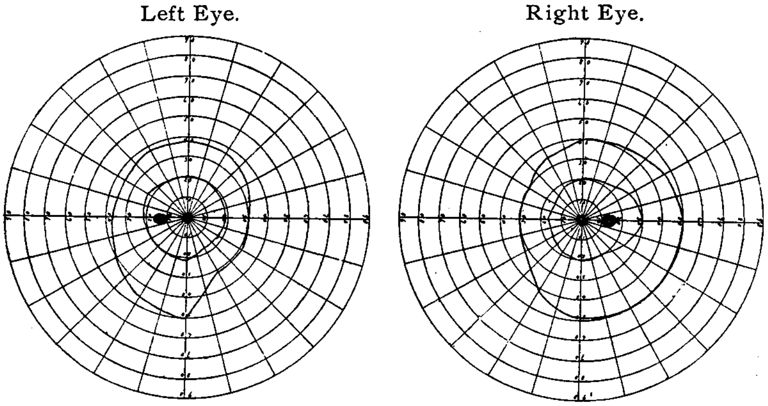

Fig. II. Fields for form and color in Case II, showing much contraction, especially in the left eye, The inner circle represents the field for red; the outer circle represents the field for white or form.

At the examination made October 25th, 1898, the general appearance was that of poor health but no distinct evidences of hysteria were found. Feet and hands always cold. Menstruation somewhat irregular. Urine normal. Miss F. suffers occasionally in the daytime with pain in the upper right side of the body, which, however, usually occurs in violent paroxysms at night, waking her out of sleep. The focus of pain seems to be in the right upper shoulder, above the clavicle, the pain radiating from this point into the neck and right arm, or sometimes into the left shoulder. There is also at times severe pain in the right hip. Neither active nor passive motions of the parts affected, nor pressure over the focus of the pain, elicits more than the normal sensations. The whole right arm is very weak, and the fingers and thumb are habitually carried in flexion, suggesting but not fully conforming with the "claw-hand." The extensors are weaker than the flexors, though the latter have very little power. The thenar and interossei muscles are markedly atrophied. No tenderness can be discovered by direct pressure or by jarring or passive movement—of the vertebral column—of the joints—or of the bones, including the sternum, or of any kind of the nerve-trunks. The right wrist reflexes are abnormally active, distinctly more so than those of the left arm. In walking Miss F. has a distinct limp of the right leg, with a suggestion of spastic gait. There is marked weakness of the whole right leg, so that when lying down she cannot lift the leg in an extended position off the bed. The muscles of the lower leg, and espcially those of the anterior tibial group, are, however, most affected, and there is some bending downwards of the toes. Both knee-jerks are exaggerated, but the right knee-jerk distinctly more so than the left; at times a right-sided knee-clonus of short duration is easily produced. There is marked ankle-clonus of the right foot,

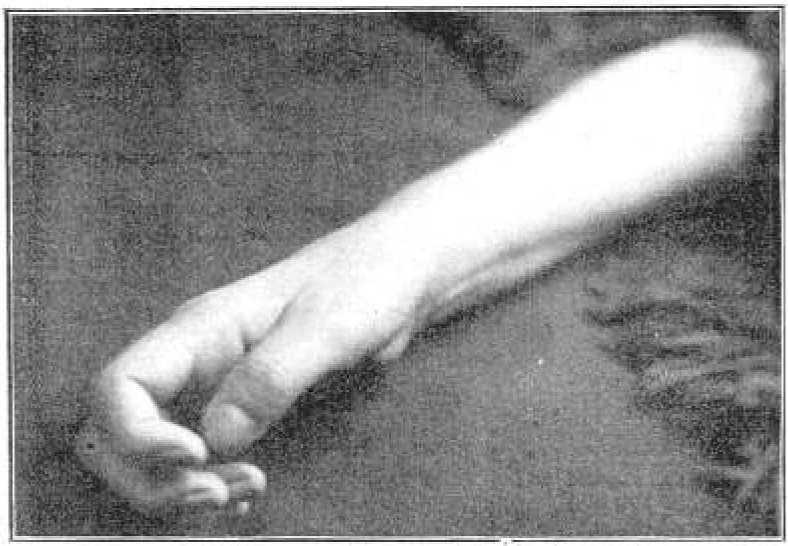

Fig. III. The hand in Case III, suggesting but not fully conform ing with the "claw-hand."

none of the left. In standing there is pronounced lordosis but no lateral curvature. There is evident weakness of the muscles of the back, as shown not only by the lordosis but also by the fact that when Miss F. bends forward she can raise the body up only slowly and with the greatest effort. She is able to get up off the floor by herself without climbing over her thighs, though the movements are very slow, awkward and feeble. There is no detectable loss of co-ordination either with eyes open or shut.

Examinations made by myself on October 25th, and several times since, and also by Dr. Jenner of the University Hospital, have given varying results as to the condition of sensibility. There seems to be always a certain amount of obtunding of sensibility over the right arm and leg, but never complete loss of sensation; the points of the esthesiometer being readily recognized but not separated in a manner at all approaching the normal perception. There have been also at times partially anesthetic areas. Thermo-sensibility in several testings has been found distinctly below par but not abolished; at no time did it seem to be more obtunded than was ordinary sensiblity. Electro-sensibility was about normal. The muscles of the arm, shoulder and thigh responded to the faradic current as well as the normal muscles; the response of the muscles of the leg and foot was distinctly sluggish and more so in the hand, but no distinct reaction of degeneration could be made out in the atrophied hand muscles.

The temperature of Miss F., is very irregular, most of the time, however, below the normal line; varying under observation between 98.5 and 96, and on a few occasions rising to 99.

Dr. Howard Mellor's report upon Miss F.'s eyes is as follows:

"Vision in each eye was 6-9 without a correcting lens; accommodation .37 m.p.p. 14 c. m. in right eye and 15 c. m. in left eye. External appearances normal. Ophthalmoscope showed in right eye: vertically ovoid disc, disc and retina over capillary, choroid ring (broken) all around disc, small scleral ring down and out, superficial layers of disc dirty red in color, deeper layers grayish, vessels slightly darker than normal. Refraction: vertical vessels +2; horizontal vessels +½.

"In the left eye, there is a vertically ovoid disc, upper nasal edge veiled, broken choroid ring all around disc, scleral ring to outside, nerve and retina over capillary, superficial layer of disc dirty red in color, deeper layers grayish, vessels toward macula region slightly tortuous. Refraction, same as in right eye. In each eye the pupils are round and react promptly to light and accommodation.

"The fields of each eye were carefully taken by my assistant, Dr. Charles C. Rankin, for both form and color and found concentrically contracted with no scotoma, as shown in accompanying diagrams."

For the purposes of diagnosis the cases just reported may be studied first, individually; second, collectively. The nature of the first case, in the absence of more detailed information, is so obscure that it is scarcely worth while to occupy space with discussion.

The lesions in the second case appear to me to be spinal and not nerve-trunkal. The earlier symptoms were believed by the doctors in attendance to be of rheumatic origin, but it is noteworthy that they were not relieved at all by rheumatic treatment; and that there could have been no real tenderness of the joints, since relief was obtained by free rubbing of the affected part. I have very little doubt but that the pain was due to involvement of fibers of nerve-roots, and that the persistent lesion of a localized destruction of the nerve cells in the anterior cornua of the spinal cord.

Left Eye. Right Eye.

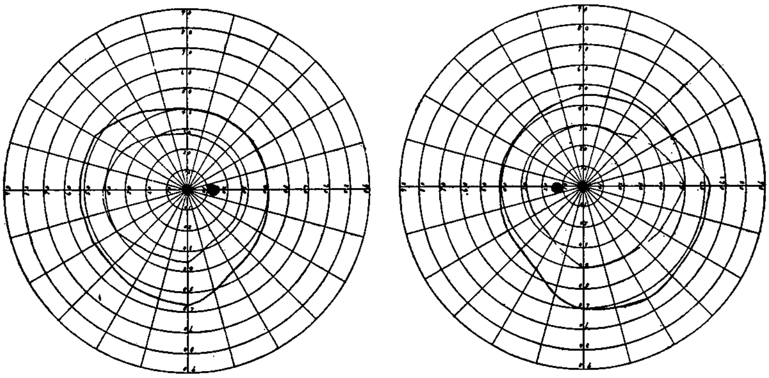

Fig. IV. Fields for form and color in Case III., showing concentric contraction without scotoma. The inner circle represents the field for red; the outer circle represents the field for white or form.

In the third case, the first diagnosis is of course between functional, hysterical and organic nature. The marked atrophy of the muscles, the changes in the eye-grounds, the absence of the hysterical temperament and of a history of past or present distinctly hysterical manifestations, have led me to throw out entirely the possibility of the palsy being of functional origin; and when the case was shown to the Philadelphia Neurological Society I think the verdict of all present was that it was a positively organic case. The absence of widespread pains and of tenderness of the nerve-trunks indicate that the lesion was not in the nerve-trunks; an indication which is so strongly corroborated by the heightened knee-jerks and the knee and ankle-clonus in the affected leg, and the exaggerated wrist reflexes of the affected arm, that the opinion that the lesion is in the spinal cord can hardly be avoided.

The wasting of the muscles indicates implication of motor spinal cells; the heightened reflexes point to a lesion of the conducting fibers, especially of the lateral columns. The disturbances of sensibility and especially the paroxysms of pain show that the lesion extends, however, beyond the territories just spoken of, and probably affects the posterior root-zone region. It would appear, therefore, that there is present a widespread degeneration, making the case resemble one of amyotrophic lateral sclerosis with an extension of the lesion into the neighboring parts.

In studying the cases collectively it is difficult to reach a positive conclusion. The existence of three cases in one family of four children certainly suggests some commonality of origin, but the first review of the symptoms indicates serious differences in the cases. Nevertheless, the points of similarity are very great, especially in the last two cases. The points of concordance are widespread spinal degeneration, certainly in part of similar nature, there being in each case apparent destruction of motor cells; parallelism or rather exact similarity of eye-symptoms and of optic nerve-degeneration; and habitual subnormal temperature.

The cases are, I believe, not instances of neuritic atrophy, differing from that disorder in the history of their development, in the position and symptoms of organic changes, and in the case of Miss F., especially, in the condition of the reflexes. It seems almost impossible that there should be an exaggeration of the reflexes in neuritic atrophy. All our knowledge and experience go to show that inflammatory changes in a nerve-trunk do not increase the tone of the tributary muscles or the activity of the reflexes. Apparently the only influence which such inflammatory nerve changes have upon the tributary muscles is one of depression, due to the more or less partial interruption of the pathway between the spinal cord and the muscles.

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246. THE ACCURACY OF VOLUNTARY MOVEMENT. R. S. Woodworth, Ph.D. (Monograph Supplement No. 13, Psychological Review, July, 1899).

This carefully-conducted and well-described research was carried out in the Psychological Laboratory of Columbia University during the college year 1898-99. It represents a very large amount of work in experimentation, as well as in compilation, and it is conducted throughout in a very commendable spirit of scientific exactness. It is especially worthy of note in that its results were prepared strictly by the statistical method, without which no research of this general nature has much value.

The voluntary movements so carefully studied were those of the arms, over 125,000 such movements having been recorded and measured in the research. The apparatus employed need not be here described, being at once simple and indisputably effective for its purpose.

The results of this research may well be taken from the table of contents, which is at the same time in part a summary. Only a portion of the points of interest to the physiologist and psychologist can here be even indicated. When the eyes are used, the accuracy diminishes as the speed increases; when not used, the accuracy varies little or none with the speed. When the speed of the motion alone increases, the accuracy of the movement is markedly in inverse ratio to the speed. When the interval between successive movements varies, the speed being constant, the accuracy diminishes as the interval is prolonged. The accuracy of initial adjustment is favored by a short interval between movements, while the accuracy of "current control" (that is, readjustments following the initial adjustment) is favored by a low speed.

As regards the validity of Weber's "law" for this phase of activity, he finds the increase in the error of movement too slow for this formula, and too fast for that law proposed as a substitute by Fullerton and Cattell. When the eyes are employed as the guiding sense-organs, the extent of the movement is judged solely thereby; when not so employed, sensations of the extent of movement are the most important factors in the control. Fatigue increases the variability of any movement; all simple central adjustments are, however, only slightly subject to fatigue. In conclusion (Part IX), Dr. Woodworth suggests, as a result of his experience in this research, an improved mode of writing based on forearm movement in place of the finger movements now in use.

DEARBORN.